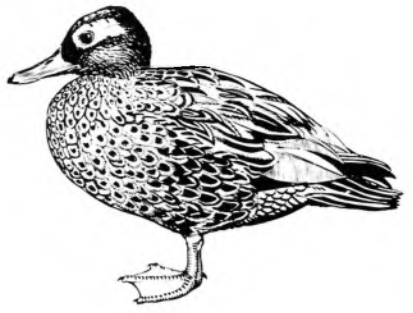
Wildfowl at Risk, 1992



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Brief accounts are given of the status and causes of decline of 50 species and subspecies of wildfowl (Anseriformes) that are known to be threatened with extinction. A number of changes are made to the earlier list presented in this journal by Kear & Williams (1978), and each taxon is assigned a provisional category of threat in line with recent proposals for the re-evaluation of IUCN categories made by Mace & Lande (1991).

This is a short review of the Anseriform species and subspecies (families Anatidae and Anhimidae) that are currently considered "threatened" with extinction. It gives summaries of the current understanding of the status of and threats to each taxon, and is based on a more detailed and continuing review of these taxa that was initiated in 1990 on behalf of The Wildfowl & Wetlands Trust. These activities are now conducted under the umbrella of the new Threatened Waterfowl Research Group of the International Waterfowl & Wetlands Research Bureau (IWRB) which produces a biannual newsletter circulated to over 300 people across the world working on threatened wildfowl. This follows on from earlier work by Dr Janet Kear (formerly Chair of the Endangered Waterfowl Group) and Gwyn Williams who published earlier reviews of threatened wildfowl in this journal (Kear & Williams 1978, Kear 1979) that contain much historical information that is not repeated here. The list of taxa presented here differs considerably from the earlier list of Kear & Williams (1978) for a number of reasons. It also differs considerably from the current IUCN list (WCMC 1990) which does not contain wildfowl threatened only at the subspecific level.

As research into wildfowl taxonomy has progressed and knowledge of the distribution and population size of wildfowl taxa has improved, it has become clear that some taxa on the earlier list of Kear & Williams are not significantly "threatened", or cannot genuinely be considered to be a separate taxon. Equally, improved monitoring has identified additional taxa that are in rapid decline and have low population sizes, and these taxa have been added to the list. Information on the status of wildfowl has been greatly enhanced by the expansion of the mid-winter censuses organised by IWRB and Asian Wetland Bureau, which now cover large parts of Europe, Asia, Africa and South America. The Asian Waterfowl Census (van der Ven 1987, 1988, Scott & Rose 1989, Perennou *et al.* 1990, Perennou & Mundkur 1991) has produced particularly useful data on a large number of threatened taxa, and is often referred to below. In the past 13 years, successful conservation action has brought a few taxa out of danger, while the advance of wetland destruction, deforestation and intense hunting pressure has brought additional taxa into danger.

Lists of threatened wildfowl are inevitably compiled partly on a subjective basis. The IUCN categories themselves are subjective (with the exception of EXTINCT) and are inevitably applied in different ways by different workers in different continents. This in turn means that a global list ends up with a strong regional bias that may explain some apparent discrepancies in the current IUCN list. For example, New Zealand and Madagascar both hold a number of highly endangered bird species, and by comparison the Blue Duck *Hymenolaimus malacorhynchos* and Meller's Duck *Anas melleri* may seem "safe". Yet they both have declining populations of only a few thousand and deserve listing before the Lesser White-fronted Goose *Anser erythropus* (currently listed as Rare) which is thought to have a population of over 100,000.

The list presented includes an attempt to re-evaluate "threatened" status in a more objective manner in line with current

moves to reevaluate IUCN categories themselves. New categories proposed by Mace & Lande (1991) depend primarily on the probability that a taxon will go extinct. The information needed to calculate this probability accurately is not available, and so a number of alternative criteria are offered that depend on population size, population fragmentation and current or projected rates of decline or catastrophes. In this review, the current IUCN category (WCMC 1990) is listed for each taxon. The categories are E (ENDANGERED), V (VULNERABLE), R (RARE), I (INDETERMINATE), K (INSUFFICIENTLY KNOWN) and K* (CURRENTLY UNDER REVIEW). These existing categories are followed by provisional new Mace-Lande style categories assigned using the following criteria. These are a modification of those offered by Mace & Lande (1991), necessary due to a lack of quantitative data on actual or projected rates of decline:

V = VULNERABLE. Population of 2500 to 10,000 with current or projected causes of decline OR population of 10,000 to 100,000 in rapid and widespread decline.

E = ENDANGERED. Population of 250 to 2500.

C = CRITICAL. Population of under 250.

H = Taxon threatened by increasing hybridisation with an introduced species.

These categories are assigned on the basis of the most pessimistic view within the bounds of current knowledge. For example, if a population is estimated at 200-2000, it is assumed to be 200 and if rates of decline are not known, they are assumed to be rapid. These new categories were originally assigned during the course of a review of the waterfowl to establish priorities for captive breeding and other programmes conducted in association with the Captive Breeding Specialist Group of IUCN (Ellis-Joseph, Hewston & Green 1992). It must be emphasised that these proposed new categories are under review, that they are not proposed by IUCN itself and that they do not represent a statement of how the categories in future official IUCN lists will be revised.

The taxonomy used in this review follows that of Livezey used by Madge & Burn (1988) and includes a number of subspecies whose validity is in question and which are not listed in some taxonomies such as that of Sibley & Monroe (1990).

Status Reviews of Threatened Taxa

Northern Screamer *Chauna chavaria* IUCN K/V

This species is restricted to lowland marshes in northern Colombia and northwestern Venezuela. It is declining in some areas due to habitat loss from development, but remains common in some localities (Collar & Andrew 1988) such as the Cienagas de Juan Manuel and adjacent areas (Scott & Carbonell 1986). In Colombia, the lower Magdalena, Sinu and Atrato valleys were the major areas occupied (Hilty & Brown 1986). Total population probably exceeds 10,000 (N.J. Collar in litt. 1992).

West-Indian Whistling Duck *Dendrocygna arborea* IUCN R/E

This species has been recorded widely in the Caribbean from the Bahamas, Cuba, Haiti, Dominican Republic, Jamaica, Cayman Islands, Puerto Rico, Virgin Islands and Leeward Islands. It is still widespread, but populations in Cuba, Jamaica, Dominican Republic, Haiti, Puerto Rico, Cayman Islands are all declining due to widespread wetland destruction, logging and indiscriminate and uncontrolled hunting (King 1978-79, M. Van Liefde pers. comm., N. Varty pers. comm., A. Sutton in litt.).

The total population may be no more than several thousand and the present Jamaican population is likely to be under 1000 (N. Varty pers. comm.). It is found locally in good numbers in Cuba, a "large population" is found on Barbuda and there has been a recovery of numbers on the east coast of Puerto Rico (Collar & Andrew 1988). A population in Central Conocarpus Swamp, Grand Cayman was eliminated by vegetation clearance (Scott & Carbonell 1986). Although illegal in much of the range, shooting remains widespread. In the Cayman islands there is no hunting closed season and, outside the winter, *D. arborea* are the only duck to shoot (M. Van Liefde pers. comm.). Taking of eggs for food has

contributed to the decline in Puerto Rico and other islands (J. Bond in litt. 1961, H. Raffaele in litt. 1973). In the Jibaro Wetlands in Cuba, a large population fed in rice paddies, but the numbers declined drastically after the introduction of a pest control programme in 1974 (Scott & Carbonell 1986).

Recherche Cape Barren Goose *Cereopsis novae-hollandiae griseus* IUCN -/E

The isolated population of this goose in the Recherche Islands off the south coast of Western Australia has recently been described as a distinct subspecies (Storr 1980). This taxon is at risk owing to its small population of about 1000. The nominate race has a population of around 16,000 concentrated on islands off Eyre Peninsula, South Australia, off Wilson's Promontory, Victoria and the Furneaux Group, Tasmania. This population is increasing and under no threats (Marchant & Higgins 1990).

Swan Goose *Anser cygnoides* IUCN -/V

Formerly widespread in eastern Asia, breeding in Russia, Mongolia and north-eastern China while wintering in eastern China, Japan and Korea. The breeding range in Russia has declined dramatically this century. Until recent decades, the species bred from the southern shores of the Sea of Okhotsk and Sakhalin west to the Altai, north to the Minusa Depression, northeast to the mouth of the Uda and Ayan and in the Trans-baikal and the Amur Basin. It is now restricted to the Toreiskiye Lakes in Chita, Trans-baikal (Kolosov 1983, Borodin 1984, Ler *et al.* 1989) and to the Russian Far East where Lake Udyl (lower Amur) is the only known regular breeding site (Poyazkov 1984), while breeding occurs in some years at Lake Khanka and Schastye Bay. Borodin (1984) estimated that 150 pairs bred at Lake Udyl, and some 150-250 pairs elsewhere in Russia. However, the Udyl population has since declined to about 20 pairs in 1983 (Poyazkov (1984). These figures compare with a 1951 estimate of 1300 pairs for part of Sakhalin alone (Ler *et al.* 1989).

The present breeding range in Mongolia and China is unclear. Nowak (1970) reported them as nesting in large numbers in west Mongolia with fewer in Central Mongolia. In 1977, birds were breeding at Ogii Nor and Oigon Nor in the north-central steppe (Kitson 1978). In China, the species is currently breeding in Inner Mongolia Autonomous Region, Heilongjiang Province and Jilin Province (Scott 1989). The wintering populations in Korea and Japan have crashed since 1950 where it is now an irregular visitor (Kear & Williams 1978). Wintering now occurs mainly in China in Shandong, coastal Jiangsu, Anhui and Jianxi Provinces. The Asian Waterfowl Census recorded 71,000 from Poyang Lake, Jiangxi Province in 1988, and 35,000 in Yancheng marshes, coastal Jiangsu Province in January 1988 (Scott 1989). These counts may be overestimates, and the total Chinese wintering population may be less than 50,000 (Jianjian Lu in litt.). The decline in Russia has been attributed to habitat destruction, hydro-electric schemes, controlling of river flows and hunting pressure (Kolosov 1983, Borodin 1984). The geese are relatively easy to hunt (Poyazkov 1984), and hunting is also widespread in Mongolia and China.

Middendorf's Bean Goose *Anser fabalis middendorfi* IUCN -/V
Thick-billed Bean Goose *Anser fabalis serrirostris* IUCN -/V

A. f. serrirostris breeds in the tundra zone and northern edge of the forest-tundra from the Khatanga-Lena watershed eastwards as far as the Vankarem Valley, Anadyr Basin and northern Kamchatka, and integrates with *fabalis* to the west and *middendorfi* to the south. *A. f. middendorfi* breeds in the forested river valleys of the Russian taiga from the Yenisei and basin of Lower Podkamennaya Tunguska east to the Kolyma Mountains, eastern Aldan Valley and mouth of the Ussuri. It occurs southwards as far as the Altai, northwestern Mongolia, Khangai and southern Baikal region (Ler *et al.* 1989, Stepanyan 1990). Both races winter in Japan, eastern China and Korea, and Lake Khanka is an important passage site.

In the Russian Far East, numbers of *serrirostris* have been "decimated in some places in the last 15-20 years" while *middendorfi* is "rare everywhere". Large groups of moulting birds in the Anadyr Basin in the 1930s have all but disappeared (Ler *et al.* 1989). The population of *serrirostris* in Kolyma, Anadyr and Kamtchatka

underwent a tenfold decrease from 1975 to 1990 (IWRB News, January 1991). Development associated with oil exploration on the breeding grounds and excessive hunting on migration and wintering grounds are thought responsible for the declines (Ler *et al.* 1989). Three zakazniks to protect breeding and moulting geese have been set up in Kamchatka and a hunting ban was imposed in 1983 to stop the declining trend; since then, the numbers in this area have increased slowly and at least 2000 were counted on moulting sites in Western Kamchatka in summer 1983 (Gerasimov & Gerasimov 1984, Gerasimov 1990). In Japan, wintering numbers declined to less than 1000 by 1970. Hunting of *A. fabalis* was banned in 1971 and many of the lakes and marshes used by the birds were made into Wildlife Protection Areas. Numbers then increased to 6000-7000 by the late 1980s, equally divided between the two races. Habitat destruction and pollution still pose problems for the Japanese population (Kurechi 1991).

Since 1984 there has been a joint flyway population study between the Japanese Association for Wild Geese Protection and the USSR Academy of Sciences (Kurechi 1991). During the summers of 1984-91, geese were caught and marked in four places on the west coast of Kamchatka. Three are moulting sites: Lake Makobetskoe, Lake Zubezudkan and Lake Maento, the other is a breeding area along the lower reaches of River Fuchun. About 90% of the geese banded at Lake Makobetskoe and Lake Zubezudkan were observed in Japan. This established that the population at Lake Makobetskoe consists mainly of *serrirostris* with a few *middendorfi*, and most of these birds winter on the east coast of northern Japan, including Lake Izunuma. The population at Lake Zubezudkan consists mostly of *middendorfi* that migrate to Niigata prefecture along the west coast of Japan, by way of the east coast of Sakhalin Island and Hokkaido (Kurechi 1991).

Tule White-fronted Goose *Anser albifrons gambelli* IUCN -/V

This goose breeds in the Cook Inlet in southern Alaska and stages on migration in the Summer Lake Wildlife Management Area in southern Oregon and in the Klamath Basin in northern California, and winters in the Sacramento and San Joaquin valleys of California, mainly on state and federal wildlife refuges, where the birds mingle with the more numerous Pacific Whitefronts *Anser albifrons frontalis*. Hunting is the main threat, especially in winter when mixed with the more numerous and sought-after Pacific race. Restrictive hunting regulations in California resulted in a 50% reduction in harvest of Tule Geese, and a probable doubling of population size over three years (Timm *et al.* 1982). In the early 1980s, the wintering population was estimated at around 5000 individuals (Wege 1984). Oil pollution in the breeding area is an additional threat (Timm 1979), but the main breeding and rearing areas are protected wildlife refuges. Developments of various types continue to destroy marshlands in the wintering range in California (Wege 1984).

Lesser White-fronted Goose *Anser erythropus* IUCN R/V?

The species breeds in shrubby tundra, mainly between 65 and 70°N across mainland Eurasia, from Norway to the Far East of Russia. The birds occupy three broad and distinct wintering areas. The group breeding in Scandinavia and western Siberia winters in the east Mediterranean/Black Sea area and migrates through the northern Baltic and through Hungary where numbers have declined drastically: 80,000-120,000 before 1950 reduced to a few thousand in recent years (Sterbetz 1982, Norderhaug & Norderhaug 1984). Numbers in the Scandinavian breeding range may formerly have been about 10,000 birds but now there are probably no more than 200-300 remaining (Norderhaug & Norderhaug 1984). Another group winters on the southern shores of the Caspian Sea and in Iran. This population is not thought to have changed markedly over recent years (Vinogradov quoted in Madsen 1991). An eastern population winters in southeast China, Japan and the Korean Peninsula and is thought to be in decline. The most recent estimates indicate 25-50,000 in the western group and 110,000 in the Caspian region (Madsen 1991). The Asian Waterfowl Census has recorded up to 9798 in China (1989). Although the numbers of this species exclude it from vulnerable status, declines in the west and uncertainty

about some of the counts make it advisable to treat it as such and monitor it closely.

The major cause of decline is thought to be hunting. Since the species occurs in mixed winter flocks with quarry species such as the very similar *Anser albifrons*, it remains vulnerable to hunting even though it is legally protected in Russia and Scandinavia. Numbers breeding in the far east of Siberia have declined due to economic development of the breeding habitat, intensification of agriculture in the wintering area and hunting (Ler *et al.* 1989). Between 1981 and 1989, 172 captive-bred birds were released in a former breeding area in Sweden, accompanied by Barnacle Goose *Branta leucopsis* foster parents. These birds have migrated south to the Netherlands rather than follow the traditional southeasterly migration route. The survival of released birds has been good, and at least one pair including a released goose has bred in the wild (von Essen 1991). IWRB and ICBP are collaborating in the preparation of a recovery plan for the western population.

Bar-headed Goose *Anser indicus* IUCN -/V

This goose breeds on lakes at high altitudes in the Himalayan range including parts of India, China, Nepal, Bhutan, Russia, Kirgizstan and Tadzhikhistan. In China, there are an estimated 10,000 breeding pairs in Qinghai Province and on the Tibetan plateau, with 7200 birds counted in Qinghai Hu in 1991 (Lu 1991). They no longer breed in Inner Mongolia. The wintering range is mainly in southwest China and along the valleys of the Ganges in India and the Indus in Pakistan, with small numbers in Bangladesh, Nepal and Burma. Numbers wintering in India are thought to have declined drastically, but the Asian Waterfowl Census has recorded up to 14,112 (1990). About 7000 birds winter in Yunan, Guizhou Province and southeast Tibet in China (Lu 1991). The total wintering population is likely to be at least 25,000. Hunting is certainly intense in parts of India (P.C. Bhattarcharjee pers. comm.) and habitat destruction may also be a cause of decline. Approximately 1500 birds still breed in the former USSR, where declines in numbers are attributed to hunting (Borodin 1984).

Hawaiian Goose *Branta sandvicensis* IUCN V/E

This goose, also called the Nene, is restricted to the main Hawaiian Islands where it is believed to have formerly occupied Hawaii, Maui, Kauai, and possibly Niihau and Molokai (Baldwin 1945, Morin 1987), Baldwin (1945) estimated 25,000 Nene on Hawaii alone before the arrival of the Europeans in 1778. By 1907 they were extinct on all islands except Hawaii, where about 50 survived. By 1951 there were only an estimated 30 geese left, and an international conservation programme began (Kear & Berger 1980). Since 1960, 2127 captive-bred geese have been released into eight locations on Hawaii, Maui and Kaua'i but most of the populations established are not self-sustaining and are dependent on continued releases for their survival (Black *et al.* 1991). By 1989-90 a total of 476-555 birds survived in the wild, including 73 feral birds. The low success of releases is attributed to the continuing action of the causes of the original population decline: loss of habitat as the birds were pushed into the highlands by agriculture and other human activities, loss of native vegetation through introductions of plants and herbivores and predation by introduced mongoose, cats, pigs, dogs and rats. Hunting was an additional pressure contributing to the original declines, and poaching is still considered a major cause of adult mortality on Hawaii (Morin 1987). There are also a number of Nene killed on the roads.

Survival of birds released in five upper elevation sites (above 1770 m altitude) has been particularly poor, with current numbers of birds less than 15% of the number released in four of these sites. In contrast, birds released at lower altitudes near grass pastures has been higher, particularly on Kaua'i which is mongoose-free and which has an increasing Nene population (Black *et al.* 1991). A new recovery initiative is underway combining research into population ecology, habitat management techniques, predator control, avicultural methods etc. (Black 1990).

Dusky Canada Goose *Branta canadensis occidentalis* IUCN -/V

This race of the Canada Goose breeds in the Copper River Delta, Alaska and winters

in Gray's Harbor and Willapa Bay in Washington. Queen Charlotte Island, British Columbia and Wilamette Valley, Oregon are important passage sites. Prior to 1964, the nesting area on the Copper River Delta, Alaska, was periodically flooded with brackish water, maintaining a zone of mixed forb/low shrub which was the preferred nesting habitat. A 1964 earthquake raised land levels by 2-6 feet, reducing the frequency of tidal flooding and promoting the succession of the mixed forb/shrub zone to tall shrub stands. Tall shrub habitats have increased from 2.5% to 22.9% of land area and are now the preferred nesting habitat (Campbell *et al.* 1988). The goose population declined from more than 25,000 birds in 1979 to fewer than 13,000 in 1991, largely due to ecological changes resulting from the earthquake that have increased predation of nests by brown bears *Ursus actos*, coyotes *Canis latrans* and avian predators, resulting in nest success rates as low as 5% (Hills *et al.* 1990).

The birds are also threatened by garbage landfills that attract growing numbers of nest-predating gulls, and increased oil exploration and road construction that enhance oil spill potential (Wayland 1985). Hunting on migration in the Wilamette Valley, where Duskies co-mingle with large numbers of more abundant Canada Goose races was formerly a problem but is now tightly controlled. Recent conservation actions have included providing artificial nest sites that are safe from predators, moving birds to predator-free islands and removing Brown Bears from the Copper River Delta, but these have not yet succeeded in increasing the overall population (Hren 1991).

Aleutian Canada Goose *Branta canadensis leucopareia* IUCN -/V

The original breeding range of this race in the Aleutian islands to the west of Alaska extended from Kodiak Island in the east of the island chain, to the central Kurile Islands in the west. The range contracted drastically after Blue Foxes *Alopex lagopus* were introduced in the 1920s and 1930s onto many of the islands for the fur trade, until in 1962, only a remnant population remained on Buldir Island, a small volcanic island without foxes (Jones 1963). Since 1974, a recovery programme has been in operation reintroducing captive bred geese or translocating wild geese onto islands following removal of the foxes. As a result, there are now populations in the eastern Aleutian islands and the Semidi Islands, each of 100-150 geese. Most of the birds remain in the western islands, concentrated on Buldir. The population is increasing, and from a low of an estimate 200-300 in 1963 there were about 7000 in winter 1991 with the bulk of the population still breeding on Buldir and nearby Near (Byrd in press). The geese migrate across the North Pacific to winter in very restricted areas in the Sacramento and San Joaquin valleys of California (Springer *et al.* 1978). Because the subspecies is difficult to distinguish from other Canada Geese under hunting conditions, the shooting of all Canada Geese was prohibited in all areas frequented by Aleutian geese.

Red-breasted Goose *Branta ruficollis* IUCN K/V

This goose breeds in the arctic tundra of Western and Central Siberia, mainly in the Central Taimyr Peninsula. Up until 1967, it wintered mainly in the southwestern Caspian and Iraq, but the majority have since shifted to the Black Sea coastlands, particularly the Danube Delta. The reason for this is probably the development of grasslands and cereal crops for cotton growing and market gardening (Cramp & Simmons 1977). Some birds winter in Greece, Turkey, the Manych Valley of the former USSR, Iran, Turkmenia and possibly Iraq.

The total population was formerly at least 50,000 (Uspenski 1965). Estimates dropped to 25,000 in 1963 but censuses in the breeding range suggest a possible recent increase with a current population of around 35,000 (Vinokurov 1990), and in January 1990 20,000 were counted in the Romanian side of the Danube Delta alone (A.D. Fox pers. comm.). The major feeding areas in the Romanian and Bulgarian Danube Delta are intensively farmed arable land, susceptible to future changes in agricultural practice. Hunting is still legal in the delta and occurs elsewhere in the range. Oil and gas exploration affects the breeding population and has led to the abandonment of many parts of the Yamal and eastern Gydan. Breeding birds are protected in the Taimyr State Reserve and several other refuges (Vinokurov 1990).

IWRB is currently developing proposals for coordinating monitoring throughout the flyway.

Freckled Duck *Stictonetta naevosa*
IUCN K/V

This duck breeds mainly in ephemeral wetlands in the southwest of Western Australia, southwest Queensland, west New South Wales and northern South Australia. In dry seasons it disperses widely with most of the population in southeast Australia. Numbers fluctuate widely and are probably influenced mainly by occasional periods of major flooding in inland Australia which boosts breeding (Fullager 1990). Numbers are thought to have been at their highest for this century around 1979 or 1980, following record and sustained flooding during the 1970s. Numbers then declined until the return of floods in 1984, and there has been a steady decline since then (Fullager 1990 & unpubl.). In January-February 1983, an extensive survey located 7926 Freckled Ducks and estimated a total population of 18,700 (Martindale 1984). Annual indices of abundance from aerial surveys of 12% of eastern Australia (covering most of the duck's range) were 2925, 1086, 4119, 201, 1954 and 64 for the period 1983 to 1988 (R.T. Kingsford in Fullager 1990).

Much coastal habitat has been destroyed or modified by drainage and other activities (Martindale 1984). Concentration in large, dense flocks during dry periods makes the species vulnerable to hunting, as does the habit of circling low and repeatedly under fire (Fullager 1990). On the opening day of the hunting season alone, an estimated 4.5-8.2% of the whole population was shot over 1979-82. Numbers shot over the whole seasons could be three times as high. In March 1980, 500 of a population of 700 were shot at Bool lagoon, southeast South Australia and 800 were shot in Victoria from a total of about 3000 (Martindale 1984). Despite legal protection, some hunters find the birds difficult to identify and they are often shot by mistake in mixed flocks. In Victoria, preseason counts started in 1987 to identify wetlands carrying large numbers of Freckled Duck for temporary closure to shooting during the hunting season. Also in Victoria a waterfowl identification test using videos for hunters was established in 1989 (Fullager 1990).

Ruddy-headed Goose *Chloephaga rubidiceps*
IUCN V/V

This species originally bred in large numbers in extreme southern South America on the grasslands of Tierra del Fuego and southern Magallanes Province of Chile, wintering in Buenos Aires Province in southern Argentina. In Tierra del Fuego, "countless thousands" were present in 1907, and they made up over 50% of the sheldgeese in the northern part of the island in 1953 (Scott 1954). A count in 1961 found them to be only 10% of all geese in the same area, and they were only 0.1% on the whole island in 1973. The mainland population was estimated at under 1000 in 1976 (Rumboll 1978) and is probably still declining. Winter counts in Buenos Aires Province found them to be 0.1% of all sheldgeese in 1983 and 0.3% in 1984 (Martin *et al.* 1986). The major cause of decline is probably introduction of the Patagonian gray fox *Dusicyon griseus* to Tierra del Fuego in 1951 in an effort to control numbers of European rabbits *Oryctolagus cuniculus*. The increase in fox numbers has coincided with decrease in goose numbers probably because the geese nest in open grasslands frequented by the fox. The fox does not enter woods or the transition zone between grassland and woods where the other species of sheldgeese nest (Rumboll 1978). In addition this species has been persistently persecuted by man, along with other sheldgeese, because of fears of agricultural damage. In Buenos Aires Province this goose is still persecuted by hunters and farmers who do not distinguish it from the much more abundant *C. picta* (C. Bertonatti in litt. 1991). However, the major control method used is now scaring the birds with small planes (L.A. Knell in litt. 1991).

This species is also resident and widespread in the Falkland Islands. This population has never been properly quantified but numbers have been estimated as "a few tens of thousands" (Summers & Dunnet 1984). The sheldgeese are also hunted here because of the conflict with sheep farming, but most of the birds and eggs taken are of *C. picta*. However, numbers shot are likely to have increased since 1982 owing to shooting for sport by the large garrison on the islands (Summers & Dunnet 1984). The birds are now protected on the islands, but hunting may still continue (R.W. Summers in litt. 1991).

Orinoco Goose *Neochen jubatus* IUCN -/V

This species was formerly widespread in the tropical forested lowlands of northern South America, east of the Andes and south to extreme northern Argentina (Salta Province). Its range includes the Guianas, Orinoco and tributaries in Venezuela, eastern Colombia, eastern Peru, Amazonian Brazil, Paraguay and eastern and southern Bolivia (Madge & Burn 1988). It has recently disappeared from parts of Colombia (Hilty & Brown 1986) and large areas of Brazil, and Venezuela is now the main stronghold (D.A. Scott pers. comm.) where it is recorded from states of Apure, Portuguesa, Cojedes, Anzoategui, Monagas, Territorio Amazonas and Territorio Delta Amacuro (Gomez & Cringan 1989). In Brazil it is regularly recorded in the Araguaia National Park (B.C. Forrester in litt.). In Argentina, it was common and breeding in the west Bermejo River in Salta Province in the 1980s (G. Lingua pers. comm. to P. Canevari in litt.). Scott & Carbonell (1986) recorded flocks of up to 250 at Beni and Pando lakes, Bolivia. Gomez & Cringan (1989) estimate the total South American population at 30,000-250,000 with 12,500-50,000 in Venezuela. The lack of precision in these estimates is worrying and it seems prudent to classify the species as vulnerable. It is probably threatened by hunting and habitat destruction.

Crested Shelduck *Tadorna cristata* IUCN E/C

There are only 18 records and three museum specimens of this species from locations that suggest a breeding range in the southeastern limits of the USSR, northeast China and/or northern North Korea, wintering along the coasts of South Korea, eastern China and/or southern Japan (Nowak 1983, 1984). The shortage of historical records suggests the species has been extremely rare for the last 300 years. However, they have certainly declined and many were imported to Japan from Korea during 1716-36. The last accepted record was a flock of six in March 1971 on the northeast coast of North Korea (O Myong Sok 1984). Since 1982, 200,000 leaflets have been distributed to local people in the range countries (Walmsley undated). This led to a number of unconfirmed reports of sightings from eastern China. Zhengjie (in litt. 1991) obtained seven reports from hunters, amateur ornithologists and foresters of sightings in the 1980s on the Yalu River, Tumen River, Changbaishan Mountains and Greater Xing'an Mountains. Other recent unconfirmed reports have come from Dashanbao near Zhaotong in Yunnan Province (Rank 1991). Destruction of breeding habitat is thought likely to be amongst the reasons for the decline of this species.

White-winged Wood Duck *Cairina scutulata* IUCN V/C

This duck was formerly widespread in small wetlands amidst moist tropical forest below 1500 m in northeast India, Bangladesh, Burma, Thailand, Cambodia, Laos, Vietnam and Indonesia (Java and Sumatra). There is only one confirmed record from Peninsular Malaysia. It is now almost certainly extinct in Java and Malaysia and has suffered a drastic decline elsewhere due to lowland deforestation and hunting. A recent status review and conservation plan (Green 1992) identifies 42 sites in where the species has been recorded since 1980: 17 in India (Upper Assam and Arunachal Pradesh), six in Thailand, two in Bangladesh and 15 in Sumatra. There is one record from Nam Bai Cat Tien National Park, Vietnam in January 1990. The only records from Burma since 1980 are birds captured by Thais crossing the border from Prachuap Khiri Khan Province. In Sumatra, it was formerly thought to be confined to the southeast, but there are recent and historical records from the north, west and central areas (Green & Crosby 1992b). The current status in Cambodia and Laos is unknown. The total known population is only 217 individuals, but more are likely to occur in sites that have not well been surveyed and the real population could number in thousands. Many of the subpopulations identified are under imminent threat of extinction from ongoing habitat destruction and hunting, while others may be too small to be viable in the long term. The new action plan recommends immediate surveys in key sites to identify major subpopulations, protection measures to conserve these subpopulations and further ecological research. Across the species' range deforestation continues at an annual rate of 1.5% of remaining forest. The Indonesian

population has long been recognised as morphologically distinct and is worthy of subspecific status. It would have been classified as a separate subspecies long ago were it not for an unsupported theory that the extensive leucism resulted from domestication (Hume & Marshall 1880).

South American Comb Duck *Sarkidiornis melanotos sylvicola* IUCN-/V

This duck was originally widespread across a huge range throughout tropical lowlands from eastern Panama south over eastern South America to northern Argentina and west to eastern Colombia, Bolivia and Peru. They continue to be regularly recorded from lowland tropical swamps, lakes and rivers in open, sparsely-wooded country in Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Venezuela and Panama (Scott & Carbonell 1986). They are threatened in Argentina and no doubt elsewhere by deforestation, indiscriminate poisoning of wildfowl in rice-fields by dosing grains with Parathion, and uncontrolled hunting particularly by large groups of tourist-hunters (C. Bertonatti in litt.). Although they are protected from hunting by national law in Argentina, this law is not applied (P. Canevari in litt.). Hunting is still legal in Uruguay and Venezuela (Menegheti *et al.* 1990). The total South American population has been estimated at 20,000-200,000 with 8000-40,000 of these in Venezuela (Gomez & Cringan 1989). The imprecise nature of these estimates suggests a cautious approach; the species is classified as vulnerable.

Australian Cotton Pygmy Goose *Nettapus coromandelianus albipennis* IUCN -/E

This race of the widespread Cotton Pygmy Goose is restricted to mainland Australia. It is mainly a local resident in the tropical wetlands of coastal Queensland from Cape Melville to Rockhampton. It was formerly resident south also to northeast New South Wales where it is now only present as an irregular visitor. The total population was estimated at 1500 in the early 1960s, but censuses from 1977 to 1981 reported them regularly in central Eastern Queensland with a possible increase in population (Cowling & Davies 1983). They are threatened by drainage of natural wetlands, but this may have been compensated for by the construction of numerous farm dams (Blakers *et al.* 1984). Colonisation of suitable habitats in northern New South Wales is possibly prevented by illegal hunting (Frith 1982). The spread of the introduced Water Hyacinth *Eichhornia crassipes* has made some wetlands in New South Wales unsuitable as the surface has become choked with vegetation (Marchant & Higgins 1990).

Mandarin Duck *Aix galericulata* IUCN K/V

This duck was formerly widespread in eastern USSR, northern China and Japan, but distribution increasingly fragmented and declines widely reported. It breeds in the Amur, Khabarovsk and Primorye regions of southern Far East of Russia, as far west as the Zeya Estuary (Ler *et al.* 1989). It is found on central and southern Sakhalin Island, Kunashir Island and valleys of the Amur-Ussuri river complex but has stopped breeding in the basins of several rivers since 1969 (Kolosov 1983). In China, it breeds locally in northeast in provinces of Heilungkiang and eastern Kurin, and perhaps still in Hopeh. In Japan, it breeds mainly in the north of central Honshu and Hokkaido but also on Kyusyu and Okinawa (Madge & Burn 1988). Wintering is concentrated in lowland eastern China from Chekiang to northern Kwangtung and southern Japan. Some birds are seen in South Korea throughout the year (Scott 1989).

The Russian breeding population was formerly estimated at 8000 pairs, but was much reduced by the felling of valley forests, disturbance from log-floating along rivers, industrial pollution and hunting during the breeding period and on migration (Kolosov 1983, Borodin 1984, Ler *et al.* 1989). This population is now thought to be recovering slightly as log-floating has decreased in many areas in the 1980s and some selectively logged forests have recovered. There are currently an estimated 1500 pairs (Bocharnikov pers. comm.). Madge & Burn (1988) estimate 4500-5000 breeding pairs in Japan and less than 1000 pairs in China. These estimates would suggest a total population in the order of 50,000. The major breeding grounds in China were the Tung Ling and Kirin forests, completely deforested between 1911 and 1928 (Lever 1990). Huge numbers were formerly export-

ed from China, and trapping of wintering flocks in China may be a major cause of decline (Madge & Burn 1988). The peak Asian Waterfowl Census counts are 16,163 in Japan (1989) and 2332 in China (1990). It is now a widespread resident in the UK following numerous introductions since the 18th century; the UK population is estimated at over 7000 (Davies 1988).

Blue Duck *Hymenolaimus malacorhynchos* IUCN -/E

This duck was formerly widespread on rivers throughout New Zealand from sea level to high mountains, but is now restricted to a limited number of mountain rivers on North and South Islands. A total of 3300 sightings collected from 1980 to 1991 found Blue Ducks in 15.6% of 10,000 yard grid squares in North Island and 18.0% of the squares in South Island (Cunningham 1991). The current population is estimated at 2000-4000 (Marchant & Higgins 1990). It was probably eliminated from lowland rivers by clearance of riverine vegetation under agricultural expansion. Such vegetation is thought to be essential for nesting, roosting and prevention of erosion of the rivers (Moralee 1990). Hunting by early European settlers may have caused some local extinctions (Fordyce & Tunnicliffe 1973). Introduced mammals preying on nesting birds and eggs are likely to have contributed to the decline, and as ferrets and stoats arrived at the southern tip of New Zealand in the 1920s and 1930s, Blue Duck disappeared (C. Veltman pers. comm). Introduction of trout to rivers has been proposed as a threat through competition for food, but there is no evidence for this and the density of ducks on the Manganuiateao River does not seem to have been affected by the introduction of trout (Williams 1991). A major recent threat is the development of many upland rivers for hydro-electric dams. Dams and unsuitable lowland river stretches may inhibit the exchange of birds between the headwaters of tributaries, creating a barrier to recolonisation of unoccupied but suitable habitat, and elevating inbreeding (Williams 1985). Six captive-bred birds were released on the Manganui River, Mt Egmont in April 1987. After two years, five birds were thought to be still present, and one pair had bred (Williams 1989). To compensate for poor dispersal, a programme of moving birds around from one river to another has been proposed as a future option (Williams 1985).

Baikal Teal *Anas formosa* IUCN V/V

This teal has undergone a drastic decline from being one of the commonest ducks in northeast Asia to being one of the rarest, and Asian Wetland Bureau are preparing a status review and conservation plan for the species (Poole 1990). It was formerly widespread as a breeding bird in northeast Siberia, concentrated around the northern river valleys of the Arctic drainage basin. There are no recent records from the western breeding range around the Ob, Yensie and Taz. It winters in southeast China (especially the Lower Yangtze) and Japan (especially the southwest). On passage, it occurs in the South Far East Russia (particularly the Amur Valley and Lake Khanka), eastern China and Korea. Since 1984 many birds have wintered in Kyongsangnam Province, South Korea, mainly at three small water reservoirs known coloquially as Ch'unam Lake.

Winter flocks of 100,000 were formerly seen at Osaka, Japan (Austin & Kuroda 1953), but following a population crash by 1990 there were only 2060 in the whole of Japan. At Lake Biwa, Japan in the 1950s, Baikal Teal were the most numerous wintering duck forming huge concentrations, but in 1989 there were only three. The Spring passage population at Lake Khanka has declined from 40,000-50,000 in the early sixties to 5000-10,000 in recent years. On Spring passage in Hebei Province, China it was extremely abundant with dense flocks of up to 2000 in 1944. Continous Spring coverage from 1986-89 found only eight birds. The current known world wintering population is estimated at 40,000 birds, but actual population may be up to 60,000. The population at Ch'unam was discovered in 1984 and has recently increased from 5000 (84-85) to 20,000 (87-90). This increase may be related to a northward shift in the Japanese wintering population, reflecting a northward movement of the mid-winter isotherm. About 19,000 birds are thought to winter in China.

Hunting for food and trade is the major cause of decline. The formation of very large, dense monospecific flocks makes them very vulnerable to shooting and netting. Three men with throw-nets took 50,000 birds in 20 days on a pond in Japan

in 1947. Hunting has now almost stopped in Japan, but is still widespread in China and on passage in the Soviet Union. In the first half of this century, birds were imported by the thousand to Europe and North America. Some birds are still exported from China to Hong Kong and Japan, and the bird is currently being proposed for listing in Appendix II of the CITES convention. At Ch'unam, the birds feed exclusively in rice-fields and their food supply is threatened by changes in harvesting methods and convertion to market gardening. This population is also threatened by disturbance from fishermen, illegal hunters and tourists, by collisions with overhead power cables, and pollution (Poole *et al.* 1990, Allport *et al.* 1991).

Madagascar Teal *Anas bernieri* IUCN V/C

This teal was formerly recorded at saline lakes, marshes and on estuaries along the west coast of Madagascar, from the far north as far south as Lake Ihotry. It was already considered as rare and localised by 1930 (Collar & Stuart 1985). In the 1970s, the Antsalova region, particularly Lakes Bemamba and Masama, was thought to be a major area for it. In 1970 there were 60 on Lake Masama (King 1981) but none were present here in 1973 and 1992. Scott & Lubbock (1975) saw 81 and estimated 120 for the whole of Lake Bemamba in 1973 but a survey of the lake in 1992 by the Jersey Wildlife Preservation Trust and The Wildfowl & Wetlands Trust found only 20. Since 1980 there have also been records from Lake Kinkony (Collar & Stuart 1985) Morondava (Dee 1986) and Lake Ihotry (H.G. Young pers. comm.).

Hunting is likely to have been a major cause of decline. Thirteen teal were shot at Lake Masama in 1970. In Lake Bemamba, locals are reported to take eggs and hunt adults with dogs. The habitat in Lake Bemamba has been transformed by conversion to rice agriculture and introduction of exotic fish. Fish have also been introduced to all other major wetlands in the range, and much potential habitat has been drained (Collar & Stuart 1985).

Andaman Teal *Anas gibberifrons albogularis* IUCN -/V

This race of the Grey Teal is restricted to freshwater lakes of the Andaman Islands (India). It was formerly very abundant, with "tens of thousands" being seen on one lake before 1957. It has declined on the central islands following drainage and residential development and is now thought to be most abundant in Colinpur, Tusnabad, Denis Point and Rees Island (Kear & Williams 1978). Hunting is possibly a threat in more remote islands. Large scale development on the islands is a possibility in the future. Recent surveys suggest a population of no more than 3000-4000 (S.A. Hussain pers. comm.).

Auckland Islands Flightless Teal *Anas aucklandica aucklandica* IUCN R/E

This flightless subspecies of the Brown Teal was formerly recorded from all the Auckland Islands 460 km south of New Zealand, but has declined following the introduction of cats, pigs and other mammals that predate the ducks and remove vital vegetation cover. Birds were last seen on Auckland Island itself in 1942, but apparently stable populations remain on ten smaller islands where they are concentrated along the shoreline and along streams. Williams (1986) conducted surveys and mark-recapture studies on Rose, Ocean, Ewing and Enderby and estimated 215-330 birds for these four islands and 500-600 in total. Moore & Walker (1991) conducted further surveys on Ewing, where they estimated 100-169 birds and Adams, where they estimated 160-220 birds.

Campbell Island Flightless Teal *Anas aucklandica nesiotis* IUCN R/C

This second flightless subspecies of the Brown Teal became extinct on Campbell Island itself, 800 km south of New Zealand, following rat and cat introductions. Rediscovered on nearby Dent Island, a tiny stack 700 m long, in 1975, the ducks live under tussock and may not have access to the coast as it is very rugged (Dumbell 1986, Goudswaard 1991). The population is considered to be at carrying capacity and is estimated at 60. Fourteen have been taken into captivity (Goudswaard 1991).

New Zealand Brown Teal *Anas aucklandica chlorotis* IUCN R/V

The Brown Teal was formerly widely dis-

tributed in New Zealand, but underwent a massive decline from 1860 to 1930 following European settlement (Hayes & Williams 1982, Dumbell 1986). The largest concentrations of ducks originally inhabited lowland kahikatea *Podocarpus dacrydioides* swamp forest which has been almost entirely drained, cleared and converted into lowland pasture. Until it was banned in 1921, hunting was intense, and was probably responsible for rapid decline in some areas. The spread of stoats, cats and other introduced predators is probably also a cause of decline and extinction of teal on Stewart Island in 1972 coincided with the spread of cats. By 1968, the only remaining large populations were on Great Barrier Island and in Northland on North Island. The total population is now estimated at 2700 with a stable population of 1500 birds on Great Barrier Island (Hayes & Dumbell 1989). The wild Northland population is estimated at 1000, some of which use overgrown farm ponds as breeding territories. Elsewhere, wild birds are now only occasionally reported from Waikato, Bay of Plenty, Manawatu (North Island) and Fiordland (South Island).

Releases of captive-bred birds in various locations began in 1968 in what became Operation Pateke, now coordinated by Ducks Unlimited and the Department of Conservation. Between 1977 and 1983, 320 birds were released at Mananatu, North Island. Breeding followed release, but the birds dispersed and disappeared under the disturbance of the annual hunting season. A similar fate met birds released in six other areas of the northern islands, and in 1984 the recovery programme became concentrated in Northland, where several hundred wild Brown Teal survived, in an effort to stabilise this declining population rather than attempt to re-establish new ones (Hayes & Dumbell 1989). Releases have been concentrated on areas where new lagoon habitats have been created to provide sites for communal roosts that play an essential role in the life cycle. From 1984-89, about 600 birds were released in Northland, mainly at Mimiwhangata Farm Park and Purerua Peninsular. Present data suggest the released birds are breeding and surviving successfully, and there is a population of about 80 established at Mimiwhingata (Ducks Unlimited 1989). Releases have also established some small populations on offshore islands, but it remains to be seen whether any of these are self-sustaining in the long term.

Hawaiian Duck *Anas wyvilliana* IUCN E/E

The Hawaiian Duck, or Koloa was formerly recorded on all the major Hawaiian Islands except Lanai and Kahoolawe (Perkins 1903) but was eliminated from all islands except Kauai by a combination of wetland drainage, the introduction of the mongoose *Herpestes auropunctatus* and other mammalian predators (mongoose never reached Kauai), indiscriminate shooting, and hybridisation with other waterfowl, particularly feral Mallards (Schwartz & Schwartz 1953). Kauai is mongoose-free, and held an estimated population of 3000 Koloa in 1967 (Swedberg 1967). The habitat for this population is now protected, hunting has stopped (Kear & Williams 1978) and suspected hybrids are removed from the population. Between 1955 and 1981, captive-bred birds were reintroduced to Oahu and Hawaii. This appears to have been succesful on Hawaii, where Kaui are now locally abundant on the windward slopes of Mt Kohala and Mauna Kea (A. Marshall pers. comm, E. Kosaka pers. comm.). The current total population is probably about 2000 (A. Marshall & F. Duvall pers. comm.).

Laysan Teal *Anas laysanensis* IUCN R/E

This teal is restricted to Laysan Island (370 ha) in the northwest Hawaiian Islands and came close to extinction in the early part of the century following the introduction of rabbits and hunting by guano miners and feather hunters. By 1911, the population had declined to as low as six or seven birds (Moulton & Weller 1984). The rabbits were eliminated in 1923 and the vegetation began to recover. Severe fluctuations in numbers have since been reported but this may be largely as a result of variation in the accuracy of different census methods. Recent estimates indicate the population is around 500 birds and at carrying capacity (Moulton & Weller 1984, Marshall 1989). The population is now well protected and monitored (US Fish and Wildlife Service 1982) but at risk from extreme weather conditions (severe droughts or storms which particularly affect breeding success), the potential introduction of harmful

species, the potential loss of habitat due to filling in of the central lake by shifting sands and the possible sea level rise resulting from global warming. Laysan Island is only 12 m above sea level at its highest point.

Meller's Duck *Anas melleri* IUCN -/V

This species is endemic to Madagascar and formerly recorded throughout freshwater wetlands of eastern Madagascar, particularly the central massif (Dee 1986). The extent of its current range is uncertain but it has been recorded since 1980 over a wide area including Lake Mandrosez, Antananarivo, Ranomafana, Lake Mantasoa, Andilamena and Ankarafantsika (Dee 1986, R.Buisson pers. comm., H.G. Young pers. comm.). It was introduced to Mauritius, 840 km east of Madagascar, before 1800, where small numbers still survive. A marked decline in numbers in Madasgascar was first noted in 1973 (Dee 1986) and is attributed to hunting pressure. Young & Smith (1989) found it was still widespread on Lake Alaotra in 1989, when flocks of up to 260 were seen and it was the second commonest wildfowl after Red-billed Pintail *A. erythrorhyncha*, but its numbers were considered much reduced. It is easy to hunt and is taken more often on Lake Alaotra than any other species. The total population for Madagascar is certainly less than 10,000 (O. Langrand pers. comm. to H.G. Young).

New Zealand Grey Duck *Anas superciliosa superciliosa* IUCN -/H

A. s. superciliosa was formerly very widespread on inland wetlands in New Zealand and neighbouring southern islands, including Kermadec, Chatham, Auckland, Campbell and Macquarie Islands. The Australian Black Duck, *A. s. rogersi* is widespread in Australia and found in southern New Guinea and various East Indian islands. Numbers of pure birds are now in decline owing to hybridisation with the Mallard *A. platyrhynchos* deliberately introduced to from 1867 onwards (Thomson 1922). Hybridisation is most widespread in New Zealand, where there were an estimated 1.5 million Black Duck in 1970 declining to 1.2 million by 1981. In 1960 Black Duck formed 95% of the *Anas* population in New Zealand, but this fell to less than 20% by 1985 as the Mallard spread. In Otago, South Island, the proportion of pure Grey Ducks fell to less than 5% in 1981, with 51% hybrids and 44% pure Mallards (Gillespie 1985). Hybridisation is most extensive in agricultural areas, where Mallards are particularly successful. The same process is now occurring in Australia as the Mallard spreads (Marchant & Higgins 1990).

Philippine Duck *Anas luzonica* IUCN -/E

The status of this Philippine species is little known. Scott (1989) records it from Luzon, Mindoro, Leyte, Bohol, Olango and Mindanao. They were previously present on Masbate (Madge & Burn 1988). It was recently recorded from Cebu (E.C. Dickinson pers. comm.). It may be affected by the drainage of permanent freshwater marshes for conversion into agriculture, limiting the habitat available during the dry season (Dickinson in litt. 1977). It would also become severely threatened by hunting if present firearms restrictions are lifted (E.C. Dickinson pers. comm.). The population size is unknown and could be only a few thousand. On Luzon, it is "common" at Buguey Wetlands and Candaba Swamp, and there are up to 250 in Tayabas Bay and 200 in Lalaguna marsh (Scott 1989). A flock of over 1000 was seen on Luzon in 1978 (E.C. Dickinson pers. comm.). The peak Asian Waterfowl Census count is 571 (1990).

Kerguelen Pintail *Anas eatoni eatoni* IUCN -/V
Crozet Pintail *Anas eatoni drygalskyi* IUCN -/E

A.e.eatoni is restricted to Kerguelen (3500 sq km) and outlying islands in the southern Indian Ocean. *A.e. drygalskyi* is confined to the five vegetated Crozet islands 1100 km west of Kerguelen. They are sometimes considered as two races of the Northern Pintail *Anas acuta*. In 1966, the population of in the Crozets was estimated at 1000-1200, with 400 on Possession, 30-50 on Pig Island and 400 or more on East Island (J. Voisin in litt. 1978). Stahl *et al.* (1984) estimated the numbers at 1350, with 800 on East Island, 200 on Possession Island and 200 on Penguin Island. Introduced feral cats have now almost eradicated the population on Pig Island with only an estimated 1-5 breeding pairs remaining

which probably depend on regular immigration from the Apostle Islands (J. Voisin in litt. 1991). Cats and rats have also been introduced onto Possession Island where the pintail appear to be in decline (Stahl *et al.* 1984).

Stahl *et al.* extrapolated the densities on the Crozets to reach an estimate of 40,000 for Kerguelen Pintail, but J. Voisin (in litt. 1991) considers 10,000 to be a more likely figure. This population was formerly much hunted by sealers and scientific expeditions. Since establishment of a base in 1950, 200-300 pintails are shot each year, but allegedly without impact on the population (Marchant & Higgins 1990). Feral cats have been introduced onto the main Kerguelen island. While their effect on the pintail is not known, they may be a seriously threat in the near future if petrels, the staple prey of the cats, reach low levels (Jouventin *et al.* 1988). At least 34 birds were introduced from Kerguelen to Amsterdam island 1600 km to the northeast, but although breeding occurred the population disappeared, again probably due to predation by feral cats and Brown Rats (Marchant & Higgins 1990).

South Georgia Pintail *Anas georgica georgica* IUCN -/V

This duck is resident on South Georgia and neighbouring islands in the South Atlantic, and is widespread in small numbers, frequenting most bays and coastal areas (Prince & Payne 1979). The total population is probably more than 2000 (P.A. Prince in litt). Hunting by sealers and whalers was formerly intense, but there is no longer significant hunting pressure (Marchant & Higgins 1990). Brown Rats *Rattus norvegicus* introduced in the last century are thought to eat pintail eggs, but both the pintail and the rats have a similar distribution on South Georgia, and there is no evidence that the rats have caused a decline in the duck population (P.A. Prince in litt.).

Galapagos Pintail *Anas bahamensis galapagensis* IUCN -/V

This duck was restricted to the main Galapagos Islands including Tower, James, San Cristobal, Indefatigable and Narborough (Kear & Williams 1978). The population was estimated at several thousand in the 1970s but there is no recent information and surveys are urgently required.

Tropical Cinnamon Teal *Anas cyanoptera tropica* IUCN -/C
Borrero's Cinnamon Teal *Anas cyanoptera borreroi* IUCN -/C

Both races are confined to freshwater marshes and lakes in Colombia (Snyder & Lumsden 1951). *A. c. tropica* originally occurred in the lowlands (below 1000 m) of Magdalena Valley and the entire Cauca Valley. In the Cauca, it may now be confined to Valle. *A. c. borreroi* originally occurred in highlands (2100-3100 m) of the East Andes from south Boyaca to Sabana de Bogota and mountains of east Narino and west Putumayo (Hilty & Brown 1986). Both races are severely threatened and *A. c. borreroi* was reported extinct by Ripley (1974) following over-shooting and habitat destruction, but Hilty & Brown (1986) suggested that small numbers were still resident at Sabana de Bogota. Gomez & Cringan (1985) suggest that one or both of these races exist in Venezuela, but give no evidence for this.

Marbled Teal *Marmaronetta angustirostris* IUCN V/V

This duck is still widespread but has patchy distribution in the Western Palaerctic and West Asia. In the western Mediterranean, it breeds in southern Spain and Morocco and occasionally in Tunisia and possibly Algeria. It formerly bred in France and Italy. In the eastern Mediterranean, it breeds in Turkey, Israel and Jordan, and formerly in Egypt, Macedonia (former Yugoslavia), Crete and Cyprus; it winters in Israel and Jordan and formerly Turkey. Small numbers winter in Egypt, Senegal, Nigeria, Mali and Chad. In the east, it breeds in Armenia, Azerbaijan, Turkmestan, Uzbekistan, Pakistan (Baluchistan), western China (Kekamkyl Lake, Xinxiang), Iran and probably Iraq; it winters mainly in western Iran and Pakistan with smaller numbers in India, China and Azerbaijan (Cramp & Simmons 1977, Madge & Burn 1988, Monval & Pirot 1989, Scott 1989).

The world population is about 30,000. In Iran, up to 25,000 birds are recorded in protected wintering sites. In the former USSR, the breeding range has declined drastically this century, disappearing from

Kazakhstan, Russia and much of Turkmenia, with the total population now estimated at 400 pairs (Borodin 1984, V. Vinugradov pers. comm., V.E. Flint pers. comm.). The eastern Mediterranean population is still declining, but the western Mediterranean population is stable or increasing. Habitat destruction and hunting are the major causes of decline. In the former USSR, development has led to the drainage of extensive river floodplains, lakes and marshes. Important wintering sites such as Macta marshes in Algeria and Aynas marshes in Turkey (which supported 1200 in 1968) have been drained. A status report and conservation plan is being prepared by IWRB and The Wildfowl & Wetlands Trust.

South American Pochard *Netta erythrophthalma erythrophthalma* IUCN -/V

This duck was originally locally distributed in Venezuela, Colombia, Trinidad (one record), southeastern Ecuador, Peru, northern Chile (one record), northern Argentina and eastern and northeastern Brazil (King 1978-79, Antas & Resende 1983). There are recent records from Brazil, Venezuela, Colombia and Ecuador (Scott & Carbonell 1986). It is reported to have almost disappeared through most of its range following a serious decline (King 1978-79), but has apparently always been a rare and dispersed species and is probably under-recorded and occurring largely on small lakes and marshes that are inaccessible. It has recently expanded into central Brazil, colonising man-made reservoirs (Antas & Resende 1983), and the numbers have apparently increased in northeastern Brazil for similar reasons (J. Vielliard in litt. 1980). The distribution of recent records in Brazil suggests it probably occurs from Maranhao south and east to Brasilia and Rio (B.C. Forrester in litt.). Major counts include 120 on Lagoa Piratininga east of Rio, in July and August 1991 (B.C. Forrester in litt.), 150 on Santa Maria reservoir in Brasilia National Park in 1980 (Antas & Resende 1983) and 80 at Rio de Janeiro lagoons (Scott & Carbonell 1986). The causes of any real decline are unclear but include habitat destruction. The species formerly bred at Laguna de Fuquene, Colombia, now destroyed and Lago San Pablo, Ecuador, now severely degraded (Scott & Carbonell 1986). The total South American population has been estimated at 12,500-50,000 with 5000-10,000 in Venezuela (Gomez & Cringan 1989).

Banks Island White-eye *Aythya australis extima* IUCN -/E

On the basis of size difference, this is described as an island race of the Australian White-eye from the Banks Island group of the New Hebrides archipelago. There has been no information on its status since its description in 1940 (Johnsgard 1978). It is now thought this may only be a recent colonisation by the nomadic Australian population (Madge & Burn 1988), a view supported by Marchant & Higgins (1991). A survey is urgently required.

Baer's Pochard *Aythya baeri* IUCN V/V

This bird has a small and declining population in East Asia. In Russia, it is now known only to breed in three regions of the far east centred on the Amur valley and Ussuri Basin; the extreme southwest of the Primorye, the Khanka Lowland and in the Lower Bolshaya Ussurka River (Ler *et al.* 1989). In northeast China, it breeds in Heilongjiang (Zhalong marshes), Kirin/Jilin (Xiang Hai Nature Reserve) and Liaoning (Shuangtaizi and Laio marshes, Madge & Burn 1988, Scott 1989). It is also thought to breed in North Korea (Collar & Andrew 1988). It winters in lowland eastern China south of the Yangtze River to Kwangtung, in Burma and Thailand. Small numbers also winter in northeast India, Bangladesh, Nepal, Japan, Hong Kong, Taiwan, South Korea and North Vietnam (Collar & Andrew 1988, Scott 1989). The Asian Waterfowl Census suggests a wintering population of a few thousand with up to 1080 in China, 596 in Thailand and 90 in Burma.

It is threatened by habitat destruction and hunting. In Russia, breeding areas in the Khanka Lowland and Lower Bolshaya Ussurka River have been intensively developed for agriculture and the area of suitable habitat is still decreasing (Ler *et al.* 1989). In lakes of the Yangtze and Han River basins of Hubei Province, China, a wintering population that was hunted commercially has declined drastically and the species has been seen very rarely over the

past 10-20 years. Lake drainage, pollution and hunting are thought to be responsible (Hu & Cui 1990). Some birds are still sold for food in Hong Kong market (several seen in 1989, Li Kwok Keung pers. comm.). The wintering population at Beung Boraphet, Thailand is threatened by current drainage of that site.

Ferruginous Duck *Aythya nyroca* IUCN -/V

This species has a huge range, but there are widespread reports of major declines. It breeds locally in southwestern and central Europe, eastern Europe eastwards to western China (Sinkiang and northern Szechwan) and western Mongolia. The main breeding areas are the steppe lakes of southern former USSR (especially around Caspian and Azov sea areas) and eastern Europe. It is still common in China on the Tibetan Plateau (D.A. Scott pers. comm.). Eames & Allport (1990) estimate the breeding population in Europe as 5860 pairs, with 2865 pairs in the western USSR, 2335 pairs in the Ukraine, 400 pairs in Greece and small numbers in Czechoslovakia, east Germany, Hungary, Italy and the Netherlands. It is still a widespread breeding bird in Ukraine, where it is "suffering a sharp reduction" (Lysenko 1990). The USSR breeding population was put at 140,000 pairs in 1970 and at only 5200 pairs in 1984 (Monval & Pirot 1989). It breeds in small numbers in Libya, Turkey, Iran, Afghanistan and Kashmir (Madge & Burn 1988) with some 500 pairs in Algeria in 1991 (A. Boumezbeur in litt. 1991). It formerly bred in France, West Germany, Morocco and Israel (Cramp & Simmons 1977). There were formerly 500 pairs breeding in Spain, where now there are only occasional isolated pairs (Cramp & Simmons 1977, Dolz *et al.* 1991).

In the west of its range, it winters in the Black and Caspian sea lowlands and in East and sub-Saharan Africa, with concentrations in Mali, Chad, Nigeria and Senegal. From 1983-87 there was an average winter count of 4352 in West Africa (Rose & Pirot 1990). Ruger *et al.* (1986) found a yearly mean of 13,100 for winter 1979-83 for the Black Sea-Mediterranean region; 18,100 were seen in the northern Black Sea in January 1967 (Ruger *et al.* 1986) but only up to 1500 between 1979 and 1988 (Ardamatskaya & Sabinevsky 1990). Six thousand eight hundred were seen at Lake Burullus, Egypt in 1979 but only 281 in 1990, and 25,000 were counted on Lake Skadar, Yugoslavia in January 1991 (IWRB). In the east, it winters in Iraq, Iran, Pakistan, Bangladesh and northern India. Up to 5000 have been seen in the Haor Basin, Bangladesh in previous years (Scott 1989). The Asian Waterfowl Census has recorded up to 4556 in India (1991) and up to 5150 in Turkmenia (1974). Winter counts suggest a world population of 59,000 (10,000 in West Africa, 1000 in Ukraine, 25,000 in Black Sea-Mediterranean, 13,000 in other parts of former USSR, 10,000 in rest of Asia).

Wetland drainage is thought to have eliminated many of the western populations (Madge & Burn 1988). It is subjected to high hunting pressure in China, Egypt and other areas (Hu & Cui 1990, G. Atta in litt. 1991). This species may be under-recorded owing to its secretive behaviour and failure to form the close flocks of other *Aythya* spp, even in winter (Ruger *et al.* 1986).

Madagascar Pochard *Aythya innotata* IUCN E/C

This duck was originally confined to freshwater lakes and pools of the northern central plateau of Madagascar, particularly Lake Alaotra where it was common in the 1930s (Collar & Stuart 1985, Dee 1986). Fears grew that the species was extinct when no birds had been recorded since 1970 when a pair was seen at Lake d'Ambohibao (Salvan 1972) and none had been seen at Lake Alaotra since 1960. Three surveys of Lake Alaotra in the 1980s failed to find evidence of the bird (Young & Smith 1989). However a male was found caught in a fisherman's net in Lake Alaotra on 29 August 1991 and is currently held in captivity in Antanarivo (L. Wilme in litt.).

Heavy shooting in the 1950s and 1960s and more recent habitat degradation are thought to have caused the serious decline in this species. Lake Alaotra is suffering from siltation, reclamation for agriculture and the burning of papyrus beds to create open water for fishing. Hunting using gill nets is thought to have taken a heavy toll on diving birds such as the pochard. Exotic fish have been widely introduced to lakes in the central plateau, competing with waterfowl for food and eliminating water lily beds that may be vital for the pochard (Young & Smith 1989). A survey of

remaining habitats outside Lake Alaotra is urgently required.

Steller's Eider *Polysticta stelleri* IUCN -/V

A maritime species of eastern Siberia and Alaska, the Steller's Eider breeds from the eastern Taimyr Peninsula to the west and north coasts of Alaska. There is a small wintering flock in northern Norway, but the vast majority of Siberian and Alaskan birds winter off the Alaskan Peninsula.

Numbers wintering in Alaska have declined by 50-75% in recent years, according to an US Fish and Wildlife Service (USFWS) Federal Register publication. The total wintering stock is now estimated to be 70-100,000. The species has disappeared as a breeding bird from western Alaska, and only 2000 or so pairs are thought to remain in the north. The USFWS regard the species as eligible to be listed under the 1973 Endangered Species Act, but because of other priorities, does not intend doing so at this stage.

Spectacled Eider *Somateria fischeri* IUCN -/V

This species breeds in Alaska and eastern arctic Siberia. Information from the 1970s indicated that there were 50,000 pairs nesting in Alaska, with the main stronghold being in the Yukon/Kuskokwim Delta western Alaska. Information from the Siberian range at the same time was sparse, but it was suggested that most of the population was in Alaska. Numbers in one of the species' Siberian strongholds, the Indigirka Delta in 1971 were estimated at 17-18,000 pairs (Kistchinski & Flint 1974).

Numbers have fallen drastically in recent years according to the US Fish and Wildlife Service (USFWS) Federal Register publication. Numbers in Alaska are now estimated at 3-5000 pairs, with a decline of 96% in the Yukon/Kuskokwim Delta since the 1970s. There is no information from the Siberian range, though the species is a characteristic breeding duck of the northeastern Siberian tundra (Flint & Krivenko 1990). The USFWS are proposing to list the species under the 1973 Endangered Species Act. There is no information on the possible causes of the decline, though hunting is a possibility. There is no apparent degradation of habitat, at least in Siberia (Flint & Krivenko 1990).

Brazilian Merganser *Mergus octosetaceus* IUCN I/C

This species has apparently always been rare and limited to fast-flowing upper rivers lined with tropical forest in southern Brazil, eastern Paraguay and northeastern Argentina. In Brazil, the species survives in central Goias in the Chapada dos Veadeiros National Park (Yamashita & de Paula Valle 1990), and in Minas Gerais in Serra de Canastra National Park and on the upper Paranaiba (Bartman 1988, Collar & Andrew 1988). The present status of a population in the Paraguai and upper Tocantins River (Sick & Teixeira 1979) is unclear. In Argentina, the species is limited to Misiones State, and still occurs in small numbers on the Iguazu and Urugua-í rivers (Scott & Carbonell 1986). A recent survey of 198 km of apparently suitable rivers in Paraguay failed to find any mergansers, and the species is possibly extinct there (Anon 1990).

Hydro-electric dams such as the Itaipu dam of Brazil and Paraguay have flooded large areas of the species' habitat (Menegheti *et al.* 1990). The population in Sielva Misionera Reserve, Argentina has recently lost habitat owing to a new dam on the Urugua-í (Luthin 1988, Menegheti *et al.* 1990). Human settlement of river banks, increasing turbidity of rivers caused by deforestation in the watershed, and hunting for museum specimens are also thought to be causes of decline (Johnson & Chebez 1985, Anon 1990). ICBP is helping the Argentine Wildlife Foundation acquire forest along the Urugua-i that will provide a protected link between two state-run forest reserves (Collar 1990).

Available data suggest the total population may be less than 250. A Farnborough College of Technology expedition to the Misiones region of Argentina in 1993 plans to survey most of its known range in that country.

Scaly-sided Merganser *Mergus squamatus* IUCN R/V

This species breeds mainly in the mixed riverine forest of the Khabarovsk and Primorye regions of the Russian Far East. In China, it breeds on the Hulun Buir-Imim River in the Nei Mongol Autonomous Region. Jingpo Lake and the Changbai, Small Xin'an and Xiao Hinggan Mountains

of the northeastern provinces. Small numbers probably breed at Lake Chon-ji and Lake Sarnjiyan in North Korea (Collar & Andrew 1988). The main wintering grounds are in southern China in the Sichuan, Hubei, Jilin, Hunan, Guizhou, Fujian and Guangdong Provinces, with smaller numbers on the Yalu and Tumen rivers in Jilin Province (Zhengjie *et al.* in prep.). Small numbers also winter in Japan, the Korean Peninsula, Taiwan, Vietnam, Burma, Tibet and Thailand.

The world breeding population is estimated at about 1200 pairs. In Russia, a maximum of 950 pairs breed in the Primorye and about 100 pairs in Khabarovsk (Bocharnikov 1990) and at least 432 birds were seen during a survey of the Bikin River in 1991 (Hughes 1991) with no more than 200 breeding pairs on the whole river. The Bikin is now the main stronghold, but there are plans for a joint Russian-Korean logging contract along the river. In addition, an estimated 100 birds are shot every year as they fly up the river (V. Bocharnikov pers. comm. to Hughes 1991). The nearby Imam River was formerly considered to be the major breeding site for the species with 350 pairs, but has now been severely degraded by logging and mining activities. Up to 400 pairs occur on the east slopes of the Sikhote-Alin Mountains (Bocharnikov 1990). One hundred pairs are thought to breed in China (Zhengjie in litt.). No more than 500 birds have been counted in China in mid-winter, and it is likely that major concentrations remain to be discovered. An international status review and action plan are planned for preparation at Slimbridge.

White-headed Duck *Oxyura leucocephala* IUCN V/V-H

This duck still has a wide but patchy distribution from the western Mediterranean to the steppe lands of Central Asia. In the east, there is a migratory population breeding mainly in Kazakhstan and West Siberia and wintering mainly in Turkey. It was formerly recorded breeding in central Siberia, Tadjikistan, Azerbaijan and China (Xinjiang Uygar Autonomous Region) where current status is unknown. There are small breeding populations in Iran, Turkmenia and Turkey. Wintering also occurs in Turkmenia, Azerbaijan, Pakistan, Iran, Israel and Saudi Arabia and possibly in Afghanistan and Iraq. In the west, breeding populations have disappeared in the past century from Morocco, Egypt, Israel, France, Italy, Hungary, Yugoslavia, Albania & Greece, where now the species is only an occasional winter visitor. Resident breeding populations still survive in Spain and Algeria, with occasional breeding in Tunisia and Rumania. Recent status reports (Anstey 1989, Green & Anstey 1992) show the world wintering population is now at least 19,000 birds, with up to 11,000 of them recorded at Burdur Gölü in Turkey and a 1991 record of 3100 at Lake Aggol, Azerbaijan.

Widespread declines are likely to have occurred following extensive drainage of the shallow lakes used by the species for breeding and wintering. There is little quantitative information on how much habitat has been destroyed, but in Andalucia, Spain 60% of the lagoons frequented by the species have been destroyed this century (Agencia de Medio Ambiente pers. comm.). Intense hunting is also a problem in some areas and may have caused most of the local extinctions. In Spain an exemplary conservation programme protecting habitat and preventing hunting has led to an increase in the population from 22 in 1977 to 786 in 1992. Measures are now being taken to control pollution, siltation and hunting problems at Burdur Gölü. The most significant threat is the spread of the North American Ruddy Duck *O. jamaicensis* across Europe from the UK, where it was introduced in the 1950s and is now undergoing exponential population growth (Hughes 1991). Ruddy Ducks and hybrids between the two species have already been observed amongst White-headed Ducks in Spain, and Ruddy Ducks have the potential to become an abundant species across the White-headed Duck's range, eliminating the latter by hybridisation and competition. Hybrids between the two species have been produced at Slimbridge and found to interbreed successfully with each other and White-headed Ducks.

Madagascar White-backed Duck *Thalassornis leuconotus insularis* IUCN -/E

This species was formerly quite common in freshwater lakes and marshes in Madagascar, found everywhere apart from the Central High Plateau, but has declined more drastically in recent decades than

any other Madagascan marsh species and is now rare (Langrand 1990). Hunting and habitat modification are the major threats. The widespread introduction of exotic fish has removed vegetation in some areas, and the spread of exotic plants such as *Eichhornia crassipes* (Pontederiaceae) has made others unsuitable (Langrand 1990). In West Madagascar, a 1989 Cambridge University expedition found a total of about 50 on Lakes Antsamaky, Andranolava, Soamalipo, Masama and Befotaka (R. Hendy pers. comm.). It is still fairly common at lakes and marshes of Soalala (Langrand 1990).

Taxa Listed in Kear & Williams (1978) and Kear (1979) but no longer Considered Threatened

Trumpeter Swan *Cygnus cygnus buccinator*

Black-necked Swan *Cygnus melanocoryphus* An abundant and widely distributed species (Scott & Carbonell 1986).

Bewick's swan *Cygnus columbianus bewickii*

Coscoroba swan *Coscoroba coscoroba* Abundant and widespread, e.g. 15,000 recorded together at Laguna Llancanelo, Mendoza Province, Argentina in April 1990 (E. Carp & M. Carbonell unpub. report).

Cape Barren Goose *Cereopsis novae-hollandiae novae-hollandiae*

Johansen's Bean Goose *Anser fabalis johanseni* No longer considered a valid race, as many individuals of *A. f. fabalis* ringed in the Netherlands have been recovered from its supposed breeding grounds (B. Ebbinge in litt. 1991).

New Zealand Scaup *Aythya novaeseelandae* Well protected and increasing population of probably over 10,000 colonising new lakes created by hydro-electric schemes and for water storage (Marchant & Higgins 1990, M. Williams in litt. 1992).

Mexican Duck *Anas platyrhynchos diazi* Now combined together with the former Florida Duck and Mottled Duck to form the Mottled Duck *Anas fulvigula* with no distinct races (F. Bellrose in litt.). However, the total population is below 100,000 and there is some concern over the species.

Eastern Greylag Goose *Anser anser rubrirostris*

Elgas's White-fronted Goose *Anser albifrons elgasi*

Giant Canada Goose *Branta canadensis maxima*

Taxa Regarded as Extinct

New Britain Wandering Whistling Duck *Dendrocygna arcuata pygmaea*

Niceforo's Pintail *Anas georgica niceforoi*

Rennell Island Grey Teal *Anas gibberifrons remissa*

Coues' Gadwall *Anas strepera couesi*

Marianas Mallard *Anas platyrhynchos oustaleti*

Auckland Islands Merganser *Mergus australis*

Labrador Duck *Camptorhynchus labradorius*

Pink-headed Duck *Rhodonessa caryophyllacea*

The author requests updated information from readers on any of the taxa listed above, and on the status of any of the following additional taxa that may be threatened and are currently under review: Abyssinian Blue-winged Goose *Cyanochen cyanopterus*, Patagonian Kelp Goose *Chloephaga hybrida hybrida*, Falkland Island Kelp Goose *Chloephaga hybrida malvinarum*, Red-backed Radjah Shelduck *Tadorna radjah rufitergum*, White-headed Steamer Duck *Tachyeres leucocephalus*, Falkland Flightless Steamer Duck *Tachyeres brachypterus*, Hartlaub's Duck *Pteronetta hartlaubi*, Chilean Torrent Duck *Merganetta armata armata*, Colombian Torrent Duck *Merganetta armata columbiana*, Peruvian Torrent Duck *Merganetta armata leucogenis*, Salvadori's Duck *Salvadorina waiguensis*, Gabon Black Duck *Anas sparsa maclatchyi*, Abyssinian Black Duck *Anas sparsa leucostigma*, South African Black Duck *Anas sparsa sparsa*, Merida Teal *Anas flavirostris altipetens*, Andean Teal *Anas flavirostris andium*, East Indian Grey Teal *Anas gibberifrons gibberifrons*, Pelew Island Grey Duck *Anas superciliosa pelewensis*, Bronze-winged Duck *Anas specularis*, Asiatic Goosander *Mergus merganser comatus*, Colombian Ruddy Duck *Oxyura jamaicensis andina*, Maccoa Duck *Oxyura maccoa*, African White-backed Duck *Thalassornis leuconotus leuconotus*.

Information in the form of a short article is welcomed for submission to the newsletter of the IWRB Threatened Waterfowl Research Group. All readers submitting information will be included on the mailing list for future issues of the newsletter.

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